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A Study of Heavy-Ion Elastic Scattering Reactions Using a Semimicroscopic Model

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Abstract: The differential cross sections for elastic scattering of ^{16}O from ^{20}Ne have been calculated using an optical potential and distorted wave Born approximation (DWBA) calculations. In the present calculations several prescriptions were tried in the ion-ion potential. The DWBA calculations were performed employing folded real and Woods-Saxon optical potentials for the distorted waves. Inclusion of the exchange process explains the large back-angle cross sections. The elastic scattering differential cross sections are successfully described by calculations in which elastic alpha-transfer amplitudes are coherently added to direct elastic scattering amplitudes.